

**SCOPE OF WORK FOR RADIOLOGICAL SCREENING
NEW ACCESS ROAD-SOUTH MOUND AREA-
DUSABLE PARK, CHICAGO, IL
December 20, 2007**

INTRODUCTION

DuSable Park (the "Site") is located in the Streeterville area of Chicago, an area of reclaimed land where fill material was placed along the Lake Michigan shoreline starting in the 1860's. The Site is located at the eastern terminus of East North Water Street, Chicago under Lake Shore Drive and consists of a parcel totaling about 3.24 acres. Recent developments in the Streeterville area of Chicago encountered radiologically-impacted soil/fill. It is believed that the impacted fill material was originally generated as a byproduct from a former gas mantle producer that used thorium nitrate in the manufacturing process. A gas mantle manufacturing facility was located at 316 East Illinois Street from the 1900s through the mid-1930s. As a result, USEPA requires screening for thorium-impacted fill soil when invasive work is planned in Streeterville.

In October 2002, a gamma radiation surface survey was conducted on the Site. Elevated levels of thorium were detected on the Site and it is our understanding that some remediation/removal of impacted soils was conducted by Kerr-McGee Corp. However, STS has no documentation relating to the contamination levels or amount of impacted soils removed from the Site. During June and July of 2007, STS conducted surface surveying on portions of the site adjacent to the seawall along the Chicago River and the Ogden Slip. No elevated levels of thorium were detected in these areas along the perimeter of the Site. In addition, the USEPA revisited the test pits/sample locations identified in 2002. Each of the areas consisted of a shallow pit filled with numerous orange sand bags, which appeared to be underlain by a sheet of black plastic. Gamma readings were made at the top or edges of the sand bags (i.e., the sand bags were not removed to obtain readings directly over the pit soils). Unshielded Ludlum readings obtained by STS at the time of the USEPA surveys appeared to confirm the USEPA results. The attached Figure 1 shows the test pit locations where elevated thorium levels were originally detected in 2002. The test pit areas have been cordoned off with permanent chain link fencing and posted with caution signs. STS conducted screening of the western portion of the northern mound during October and November of 2007, as part of the construction of the ramp that will connect to the med-level of Lake Shore Drive. STS identified areas of elevated thorium concentrations, which (except for one) were excavated and placed into Baker boxes. In late November, Tronox, LLC, a successor to Kerr-McGee Corp., manifested and removed the excavated material from the site for disposal. The USEPA conducted confirmatory verification sampling and analysis of the remediated areas. The remaining areas of specific known contamination will be addressed in a separate scope of work.

STS prepared this Scope of Work to address potential thorium concerns for the construction related activities at the Site. Specifically, the screening activities will focus on the western portion of the southern earthen mound situated on the Site for the construction of a permanent access road to the northbound Lake Shore Drive ramp (see attached Figure 1). The first phase of construction in this area will be the construction of a temporary gravel road in February 2008 with the permanent roadway to be installed later in 2008. The western portion of the southern mound (as indicated on the attached Figure 1) will be thoroughly screened for thorium impacts. Current plans call for a permanent access road to be constructed in this area with average cuts to the western portion of the southern mound of up to twenty (20) feet. The area to be screened is shown on the attached Figure 1. STS plans to survey the proposed construction area pursuant to this scope of work prior to commencement of roadway construction in this area. The construction schedule is currently being formulated, but STS plans to commence the survey work in this area in January/February of 2008. The screening for this proposed permanent access roadway is not expected to impact the two known areas of elevated thorium impacted soils situated on the southern mound (depicted as areas B2 and B3 on Figure 1).

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SCOPE OF WORK - RADIOLOGICAL SCREENING

STS has prepared this Scope of Work for thorium radiation screening of urban fill at the Site. STS will begin field activities with the establishment of a grid network for the investigation area. STS then will excavate (grid by grid) the urban fill at the Site, as indicated in the attached Figure 1, in 18-inch lifts with radiological surveys completed between the lifts. The survey procedures will follow the procedures outlined in Standard Operating Procedure (SOP) 210, which is attached hereto as Exhibit A (please note that the methods and procedures outlined in the SOP are unchanged from those used previously on DuSable Park). The screening process will continue until the desired construction depth and/or native soil is reached. After completing a grid, excavation/screening activities will move to an adjacent grid area and the 18-inch lift screening process will be repeated. Spoil generated in this second area will be cast back into the previous excavation. This approach will continue until the radiological screening of the urban fill within the investigation area is deemed complete to meet the construction requirements.

DUSABLE PARK, CHICAGO, IL
STANDARD OPERATING PROCEDURE

Title: Gamma Radiological Surveys

Document: SOP-210

Revision Number: 0

Date: December 19, 2007

GAMMA RADIOLOGICAL SURVEYS

1.0 PURPOSE

This procedure provides protocols for pre-verification or verification gamma radiological surveys.

2.0 SCOPE

Radiological surveys will be performed at the designated Site as part of the pre-excavation, excavation, pre-verification, and/or verification surveying programs.

3.0 REFERENCES

None.

4.0 EQUIPMENT AND MATERIALS

The following equipment may be used as part of the survey programs. Other equipment may be substituted if necessary because of availability of the items listed or the conditions encountered at the site.

- Trimble Pathfinder Pro XR 4.1 GPS (optional).
- 2-inch by 2-inch NaI (TI) gamma detector.
- Ludlum Model 2221 portable scaler ratemeter analyzer.

5.0 INSTRUCTIONS FOR RADIOLOGICAL SURVEY

5.1 Establishment of Background Gamma Count Rate

- 5.1.1 The gamma count rate background levels shall be established for each applicable survey instrument. Six randomly selected locations of similar media (i.e., paved, landscaped, etc.) shall be chosen in non-radiologically impacted areas of the Site. A five-minute integrated count shall be obtained at the surface of each location for each survey instrument (Ludlum 2221 with 2" X 2" NaI probe). The measurements collected from each location shall be averaged to establish an instrument specific background gamma count rate.

5.2 Land Survey Procedure

- 5.2.1 Two perpendicular baselines will be established.
- 5.2.2 A grid along the baseline will be established using cloth or steel tape and a compass, if necessary. Stakes, survey flags, or paint will be placed as needed to delineate grid or traverse lines. The grids will be spaced about five meters apart.
- 5.2.3 The baseline, permanent structures, areas of remediation, and other areas of interest will be illustrated in the field logbook.

5.3 Gamma Survey Procedure

- 5.3.1 The Ludlum ratemeter is set for 2-second time-weighted average count rate.
- 5.3.2 Hold the survey meter probe parallel to the ground surface at a height of approximately two to six inches.

5.3.3 Walk along grid lines at a maximum speed of about 0.5 meters per second (1 mile per hour).

5.3.4 Continue surveying until all survey grids have been traversed.

5.4 Radiological Survey of On-Site Materials

5.4.1 Material that is excavated and placed in the clean stockpile will be surveyed two times. The first survey will be performed prior to excavation activities.

5.4.2 The second survey will be performed during the excavation of the non-contaminated soil.

The soils will be surveyed before they are placed in the stockpile. Based on the gamma scan, the material will either be designated as contaminated material and immediately loaded for transportation and disposal or tentatively designated as clean and stockpiled for subsequent soil sampling per SOP-214.

5.5. Daily Surveys

5.5.1 Routine daily surveys shall be performed for each day of operations at the site.

5.5.2 The routine surveys will monitor areas in the immediate vicinity of excavations and along soil movement paths to ensure that radiation levels are not affected by activities.

5.5.3 Routine surveys shall be documented by preparing a drawing of the survey results in the field logbook, indicating either the location and value of individual measurements, or contours of the measured gamma field.

5.5.4 Surveys of excavation areas will be made at the request of the Field Team Leader to assess the progress of the removal. These surveys will not be documented, but will be used by the Field Team Leader to manage the excavation.

5.6 Pre-Verification or Verification Survey

5.6.1 Upon completion of excavation activities, either a pre-verification survey shall be performed to ensure that the excavation is ready for a final verification survey by USEPA or a verification survey shall be performed to ensure that the excavation is ready for backfill based on USEPA approval.

5.6.2 The survey is conducted at the same time as the excavation work phase. The survey method is performed as specified in Sections 5.2 and 5.3. Upon completion of the survey and excavation phase, a Notification of Successful Pre-Verification or Verification is sent to the USEPA requesting a final verification survey or approval to backfill.

5.7 Site Grading Survey

5.7.1 Surveys will likely be conducted at the same time as the grading activities and will be performed as specified in Section 5.3 of this SOP.

5.7.2 The corners or boundaries of the area to be surveyed will be tied into a site-wide coordinate/survey network. Stakes, survey flags, or paint will be placed along the boundaries of the survey area using a cloth/steel tape or wheel at approximately 5 meter intervals to subdivide the area into 5 x 5 meter areas.

Gamma Radiological Surveys
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- 5.7.3 Each 5 X 5 meter area will be traversed using a line spacing of approximately 1 meter. Readings greater than twice background will be painted and flagged for further investigation.
- 5.7.4 The maximum gamma count and readings over twice background will be recorded on the radiation survey form for site grading. Permanent structures and other issues of interest also will be included on the radiation survey form.